CLAIMS

What is claimed is:

1. A composition comprising:

a composition having iron nanoparticles dispersed homogeneously throughout said composition, wherein said composition is formed by heating to a temperature of from about 300°C and above a mixture of:

a ferrocenylethynyl containing composition selected from the group consisting of 1,4-bis(ferrocenyl)butadiyne, 1-ferrocenylethynyl-4-(phenylethynyl)benzene and 1,3-bis(ferrocenylethynyl)benzene; and

an aromatic-acetylene containing composition selected from the group consisting of 1,2,4,5-tetrakis(phenylethynyl)benzene, 1,2,4-tris(phenylethynyl) and 1,3,5-tris(phenylethynyl)benzene; and

wherein said ferrocenylethynyl containing composition and said aromatic-acetylene containing composition are in molar mix proportions of between 1 and 99 of said ferrocenylethynyl containing composition and between 99 and 1 of said aromatic-acetylene containing composition.

2. The mixture of claim 1, wherein said mixture is heated to a temperature of from about 400°C.

3. The mixture of claim 1, wherein said mixture is heated to a temperature of from about 500°C.

4. The mixture of claim 1, wherein said mixture is heated to a temperature of from about 600°C.

5. The mixture of claim 1, wherein said mixture is heated to a temperature of from about 700°C.

6. The mixture of claim 1, wherein said mixture is heated to a temperature of from about 800°C.

7. The mixture of claim 1, wherein said mixture is heated to a temperature of from about 900°C.

8. The mixture of claim1, wherein said mixture is heated to a temperature of from about 1000°C and above.

9. The mixture of claim 1, wherein said mixture is heated to a temperature greater than about 300°C and held at said temperature for at least one hour.

10. The mixture of claim 1, wherein said ferrocenylethynyl containing composition and said aromatic-acetylene containing composition are in molar mix proportions of between 10 and 75

of said ferrocenylethynyl containing composition and between 90 and 25 of said aromatic-acetylene containing composition

11. A method of forming a composition containing iron nanoparticles homogeneously dispersed throughout, said method comprising the steps of:

mixing between 1 and 99 molar proportion of 1,4-bis(ferrocenyl)butadiyne and between 99 and 1 molar proportion of said an aromatic-acetylene containing composition selected from the group consisting of 1,2,4,5-tetrakis(phenylethynyl)benzene, 1,3,5-tris(phenylethynyl)benzene and 1,2,4-tris(phenylethynyl)benzene;

heating said mixture for at least 1 hour at between 300 and 1000°C; and

forming a thermoset or a carbon composition having metal nanoparticles dispersed homogeneously throughout.

12. The method of claim 11, wherein said metal nanoparticles have a size of greater than 1 nm.

13. The method of claim 11, wherein there is a decrease in the weight of said mixture of less than 20% when said mixture is heated.

14. The method of claim 11, further comprising the step of controlling the temperature and time duration at said temperature thereby providing control over the size of the metal nanoparticle.

15. The method of claim11, further comprising the step of forming thermoset fibers.

16. The method of claim 11,

wherein said mixing is between 10 and 75 molar proportion of said 1,4-bis(ferrocenyl)butadiyne and between 90 and 25 molar proportion of said aromatic-acetylene containing composition;

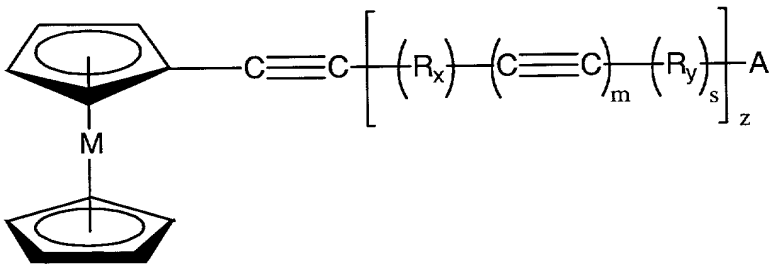
heating said mixture for at least 1 hour at between 300 and 1000°C; and

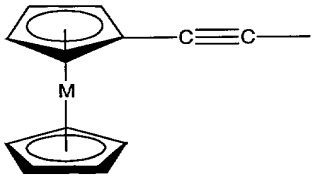
forming a thermoset or a carbon composition having metal nanoparticles dispersed homogeneously throughout.

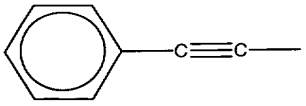
17. A composition formed by heating to a temperature of from about 300°C and above a mixture of:

an organometallic composition and an aromatic-acetylene containing compound; and

wherein said organometallic composition comprises the formula:



wherein A is selected from the group consisting of H,  ,

and  ;

wherein M is a metal selected independently from the group consisting of Fe, Mn, Ru, Co, Ni, Cr and V;

wherein Rx is independently selected from the group consisting of an aromatic, a substituted aromatic group and combinations thereof;

wherein Ry is independently selected from the group consisting of an aromatic, a substituted aromatic group and combinations thereof;

wherein m is ≥ 0;

wherein s is ≥ 0;

wherein z is ≥ 0;

wherein m and s are independently determined in each repeating unit;

wherein said aromatic-acetylene containing composition is selected from the group consisting of 1,2,4,5-tetrakis(phenylethynyl)benzene and 1,3,5-tris(phenylethynyl)benzene; and

wherein said organometallic composition and said aromatic-acetylene containing

composition are molar mix proportions of between 1 and 99 of said organometallic composition and between 99 and 1 of said aromatic-acetylene containing composition.

18. The composition of claim 17,

wherein said organometallic composition and said aromatic-acetylene containing composition are molar mix proportions of between 10 and 75 of said organometallic composition and between 90 and 25 of said aromatic-acetylene composition.